

REMARKS

By this Amendment, claims 28-31 are added. Accordingly, claims 17-31 are pending. Support for new claims 28-31 can be found at paragraph 3 of page 9 of the specification as originally filed. Reconsideration of the present application is respectfully requested.

I. The Claims Define Allowable Subject Matter

The Office Action rejects claims 17-20 and 22-26 under 35 U.S.C. §103(a) over U.S. Patent No. 6,124,614 to Ryum et al. ("Ryum"), and claims 21 and 27 under 35 U.S.C. §103(a) over Ryum in view of Semiconductor Manufacturing Technology (2001) by Quirk et al. ("Quirk"). These rejections are respectfully traversed.

Ryum does not disclose a metal-oxide-semiconductor field-effect transistor "wherein p-type impurities are doped into the germanium film, and a range of concentration of the p-type impurities is about 10^{17} to 10^{20} cm $^{-3}$," as recited in independent claims 17 and 22.

The Office Action admits that Ryum does not disclose impurities being of a p-type and within a concentration range of about 10^{17} to 10^{20} cm $^{-3}$. However, the Office Action asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the concentration range of impurities.

Applicants respectfully disagree with the assertion that it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the concentration range of impurities. MPEP §2144.05 instructs that "a particular parameter must first be recognized as a result-effect variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)." The Office Action fails to establish that the concentration of impurities is a recognized result effective variable. Thus, Applicants respectfully submit that the Office Action has not established a *prima facie* case of obviousness.

In addition, Applicants note that the Office Action has provided no teaching or suggestion for one of ordinary skill in the art to modify Ryum to use the specified concentration of impurities. Further, the Office Action has provided no teaching or suggestion of the impurities being of a p-type. Applicants submit that the features of claims 17 and 22 would not have been obvious to one of ordinary skill in the art.

Ryum discloses that the problem to be solved is to prevent the decrease in punch-through effect caused by the short distance between the source region 30A and the drain region 30B, the decrease of the breakdown voltage between the source region 30A and drain region 30B and so forth. Instead, the present application presents a problem to be solved that is to prevent the deterioration of carriers mobility in the channel in the semiconductor. Thus, Ryum does not recognize the problem to be solved by the present application. In addition, Ryum is silent as to the importance of impurities doped into the germanium film.

The MPEP §2143.01 instructs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." The MPEP §2143.01 further instructs that "[a]lthough a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.'" See also, *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). According, Applicants respectfully submit that the rejection of claims 17 and 22 is improper in view of MPEP §2144.03 because it lacks evidence of a teaching or suggestion that the features would have been obvious to one of ordinary skill.

Accordingly, Applicants respectfully assert that the rejections under 35 U.S.C. §103 should be withdrawn because the applied references, either individually or in combination, do not teach or suggest each feature of independent claims 17 and 22.

MPEP §2143.03 instructs that "[t]o establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art. *In re Royka*, 409 F.2d 981, 180 USPQ 580 (CCPA 1974)."

With respect to claims 19, 20, 25 and 26, Applicants submit that Quirk does not constitute prior art and thus cannot be applied as the basis of a 35 U.S.C. §103 rejection. The effective prior art date of Quirk is November 9, 2000 (published date), which is subsequent to the June 16, 2000 International filing date of International Application No. PCT/JP00/03968. The present application is the U.S. National Stage of PCT/JP00/03968. Thus, the effective filing date to which this application is entitled predates the effective prior art date of Quirk.

For at least these reasons, it is respectfully submitted that independent claims 17 and 22 are patentable over the applied references. The remainder of the claims that depend from independent claims 17 and 22 are likewise patentable over the applied references for at least the reasons discussed above, as well as for the additional features they recite.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 17-31 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number set forth below.

Respectfully submitted,



James A. O'Neill
Registration No. 27,075

Jeffery M. Lillywhite
Registration No. 53,220

JAO:JML/vgp

Date: July 16, 2003

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461
--